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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,374	11/19/2001	Yuuzou Kurokami	Q67336	8361

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER	
TORRES, JUAN A	

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,374	KUROKAMI, YUUZOU	
	Examiner	Art Unit	
	Juan A. Torres	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 7-11 and 13-16* is/are rejected.

7)☒ Claim(s) *6 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10082004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on March 23, 2004 was filed after the mailing date of the application on November 19, 2001. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

The drawings are objected to because in figure 1 block "36" in box 18a is suggested to be label "36a" (see application page 6 line 21. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as

per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

In the FIELD OF THE INVENTION section, line 2 the word "vertical to each other" is suggested to be changed to "orthogonal to each other".

In the DESCRIPTION OF THE RELATED ART section: in line 4 the word "vertical each other" is suggested to be changed to "orthogonal to each other"; in line 7 the word "vertical each other" is suggested to be changed to "orthogonal to each other" "; in page 2 line 4 the word "vertical each other" is suggested to be changed to "orthogonal to each other".

In page 5, line 27 the word "first endless phase shifter 26" is suggested to be changed to "second endless phase shifter 26a"

In page 6, line 10 the word "101" is suggested to be changed to "101a".

In page 11, line 9 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 11, line 26 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 12, line 16 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 14, line 2 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 14, line 12 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 14, line 25 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

In page 16, line 22 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

Appropriate correction is required.

Claim Objections

Claims 1, 7 and 13 are objected to because of the following informalities:

As per claim 1 in line 3 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

As per claim 7 in line 2 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

As per claim 13 in line 2 the word "vertical with each other" is suggested to be changed to "orthogonal with each other".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 recites the limitation "said carrier signal" in line 5 and in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "said local phase-difference" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Aono et al. (JP401291540A).

As per clam 1 Aono et al. (JP401291540A) disclose a cross polarization interference canceller comprising: (a) first and second signal receivers which receive signals having been transmitted through first and second polarizations vertical with each other (figure 3 blocks 41 and 51); (b) first and second local oscillators each of which converts one of said signals into an IF signal (figure 8 f_{R1} and f_{R2}); (c) first and second demodulators each of which demodulates said IF signal for producing a base-band signal and a cross polarization interference cancel reference signal (figure 3 DT1 and S13); (d) a phase-difference detector which detects a phase-difference between local

signals transmitted from said first and second local oscillators, and transmits a phase-difference signal indicative of the thus detected phase-difference (figure 8 blocks 63' and 64'); and (e) first and second phase controllers associated with said first and second demodulators, respectively, and each equalizing phases of said base-band signal and said cross polarization interference cancel reference signal to each other in accordance with said phase-difference signal (figure 8 blocks 43-45 and 53-55).

As per clam 2 and 8 Aono (JP401291540A) discloses a phase-difference detector transmits two phase-difference signals in which directions in which phases are deviated are opposite to each other, and wherein said first and second phase controllers receive said two phase-difference signals transmitted from said phase-difference detector, and transmit signals to said first and second demodulators, respectively, in which signals phase-shifting directions are opposite to each other (figure 4 block 31).

As per clam 7 Aono et al. (JP401291540A) disclose a cross polarization interference canceller comprising: (a) first and second signal receivers which receive signals having been transmitted through first and second polarizations vertical with each other (figure 3 blocks 41 and 51); (b) first and second local oscillators each of which converts one of said signals into an IF signal (figure 8 f_{R1} and f_{R2}); (c) first and second demodulators each of which demodulates said IF signal for producing a base-band signal and a cross polarization interference cancel reference signal (figure 3 DT1 and S13); (d) a phase-difference detector which detects a phase-difference between local signals transmitted from said first and second local oscillators, and transmits a phase-

difference signal indicative of the thus detected phase-difference (figure 8 blocks 63' and 64'); first and second phase controllers associated with said first and second demodulators, respectively, and each equalizing phases of said base-band signal and said cross polarization interference cancel reference signal to each other in accordance with said phase-difference signal (figure 8 blocks 43-45 and 53-55): and ; and a reference oscillator electrically connected to both said first and second local oscillators for synchronizing said first and second local oscillators with each other (figure 3 f_R).

Claims 13 and 14 are rejected under 35 U.S.C. 102(e) as being e by Iwamatsu (US 6236263).

As per claim 13 Iwamatsu (US 6236263) discloses a method of canceling cross polarization interference, comprising the steps of: (a) receiving signals having been transmitted through first and second polarizations orthogonal with each other (figure 15 block 102); (b) converting said signals having been received in said step (a) into IF signals (figure 15 block 103a and 103b); (c) demodulating said IF signals for producing a base-band signal and a cross polarization interference cancel reference signal (figure 15 block 104a and 104b); (d) detecting a phase-difference between said IF signals and transmitting a phase-difference signal indicative of the thus detected phase-difference (figure 16 block 124); and (e) equalizing phases of said base-band signal and said cross polarization interference cancel reference signal to each other in accordance with said phase-difference signal (figure 16 block 117).

As per claim 14 Iwamatsu (US 6236263) discloses a method comprising the step of synchronizing said signals with each other (figure 16 block 124b column 3 line 40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aono (JP401291540A) as applied to claims 2 and 8 above, and further in view of Iwamatsu (US 6236263). Aono (JP401291540A) teaches claims 2 an 8. Aono (JP401291540A) doesn't teach that the phase controller is comprised of a variable phase-shifter. Iwamatsu (US 6236263) teach a phase controller is comprised of a variable phase-shifter (figure 10 block 40). The phase-shifter used by Iwamatsu (US 6236263) could be used in the phase controller disclosed by Aono (JP401291540A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to reduce the complexity of the local oscillator to implement the phase shifter disclosed by Iwamatsu (US 6236263) in the phase controller circuit disclosed Aono (JP401291540A).

Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aono (JP401291540A) as applied to claim 1 above, and further in view of Iwamatsu (US 6236263). Aono (JP401291540A) teaches claim 1 that includes (a) to (e). Aono (JP401291540A) doesn't teach de detail composition of the demodulator. Iwamatsu (US 6236263) co-inventor of (JP401291540A) teaches the details of the demodulator, including (c1) a carrier oscillator which converts frequencies of both IF signals

transmitted through said first and second polarizations (figure 10 block 12); (c2) first and second analog-digital converters which convert said IF signals into first and second digital signals for said first and second polarizations, respectively (figure 10 block 13); (c3) a numerical controlled oscillator which transmits a carrier signal (figure 10 block 15); (c4) a first endless phase-shifter which receives both said first digital signal and said carrier signal, and demodulates said base band signal (figure 10 block 19 and 20); (c5) a second endless phase-shifter which receives both said second digital signal and said carrier signal, and demodulates said cross polarization interference cancel reference signal (figure 10 block 21' and 22'); (c6) a filter which receives said cross polarization interference cancel reference signal, and produces a first signal indicative of interference caused by said second polarization(figure 10 block 24); (c7) an adder which adds said base band signal and said first signal to each other to thereby remove cross polarization interference (figure 10 block 25 and 26); (c8) a judgment circuit which receives an output signal transmitted from said adder, and transmits an error signal (figure 10 block 27); (c9) a carrier synchronization controller which controls a frequency of said carrier signal in accordance with said error signal (figure 10 block 27a); and (c10) a tap coefficient controller which controls a tap coefficient of said filter in accordance with said error signal (figure 10 block 41). The decoder used by Iwamatsu (US 6236263) could be used in the demodulation circuit disclosed by Aono (JP401291540A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to reduce the variations of the local oscillator to

implement the decoder disclosed by Iwamatsu (US 6236263) in the demodulation circuit disclosed Aono (JP401291540A).

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aono (JP401291540A) and Iwamatsu (US 6236263) as applied to claims 4 and 10 above, and further in view of Iwamatsu (US 6236263). Aono (JP401291540A) and Iwamatsu (US 6236263) teach claims 4 an 10. Iwamatsu (US 6236263) teach that the first and second phase controllers are comprised of a variable phase-shifter (figure 10 block 27) electrically connected to said second endless phase-shifter (figure 10 block 41).

Allowable Subject Matter

Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on M-F 9:00 AM- 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAT JAT 10/18/2004

M. G/

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER